# Innovative Projects
Summer 2014

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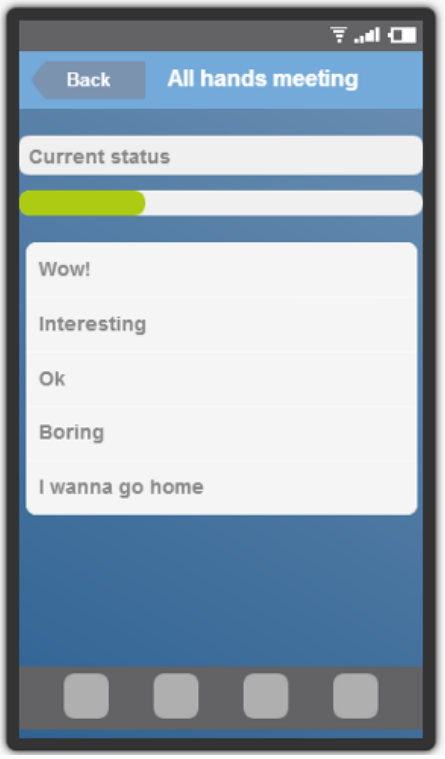
| Nr 1 | Focus meter |
|---|---|
| **Project goals** | Mobile application for measuring meeting participants focus and engagement. |
| **Scope definition** | Mobile application and web server that would allow to monitor participants mood. Based on the survey meeting agenda could be changed.   |
| **Requirements** | Windows Phone/Android |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-4 |

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| Nr 2 | Anonymous surveys |
|---|---|
| **Project goals** | Web application for making anonymous surveys |
| **Scope definition** | Application should allow survey creation for dedicated group of people. Neither survey author nor participants could be able match people with answers. Participants should be able to verify if their answers were not modified. Security of the solution should be provable. Questions can have a form of T/F checkboxes, comboboxes and text fields (in this case we can assume that the participants are aware of the risk of revealing themselves). |
| **Requirements** | - |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-4 |

| Nr 3 | DocsDB |
|---|---|
| **Project goals** | Database system that will be able to store and index any popular form of documents like mails, microsoft office formats, pdfs. |
| **Scope definition** | Web application with simple human interface based on googleâĂŹs search engine and RESTful API for feeding the database. Application should provide full-text search for the stored documents which can be based on Elasticsearch database.<br>Possible extensions:<br>- ability to fetch and index e-mail boxes<br>- ability to index files from disks<br>Useful links<br>- http://www.elasticsearch.org<br>- http://tika.apache.org<br>- http://aperture.sourceforge.net |
| **Requirements** | NoSQL database |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-4 |

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| Nr 4 | OCR for graphs and structured data |
|---|---|
| **Project goals** | Optical character recognition library for conversion of handwritten graphs and structured data into digital format. |
| **Scope definition** | Graphs can have some fixed form and limited number of elements to recognise, i.e. they can consist of arrows and boxes filled with text. They can be converted to any text format. For structured data you can define some abstract structure like: âĂIJtext and number in circle on the right hand sideâĂİ and application should try to match those with the photo. |
| **Requirements** | - |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-3 |

| Nr 5 | Augmented notification system |
|---|---|
| **Project goals** | Composite solution for distributing notifications via light, sound and touch. |
| **Scope definition** | The system could have a form of central controller with many different peripheral devices that would be used for handling notifications and alarms. The main aim is to present status of continuous integration server in a highly visible manner. Those peripheral devices could have a form of RGB lamps, signal lights (same as used for the traffic control) or usb rocket launchers. |
| **Requirements** | - |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-4 |

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| Nr 6 | Aplikacja wspierajaca spotkania |
|---|---|
| **Project goals** | Stworzenie aplikacji na Adroida lub Windows Phone uÅĆatwiajÄĚcÄĚ przekazywanie materiaÅĆÃşw pomiÄŹdzy uczestnikami spotkania. |
| **Scope definition** | Host, tworzÄĚcy spotkanie, powinien udostÄŹpniÄĞ kod OCR, do zeskanowania przez pozostaÅĆych uczestnikÃşw. Po przetworzeniu kodu, uÅijytkonik doÅĆÄĚcza do pozostaÅĆych w âĂIJwirtualnym spotkaniuâĂİ, skomunikowany poprzez poÅĆÄĚczenie internetowe lub Bluetooth. Gdy ktÃşrykolwiek z uczestnikÃşw zrobi zdjÄŹcie, bÄĚdÅž nakrÄŹci film uÅijywajÄĚc swojego telefonu, powinno byÄĞ ono natychmiastowo rozesÅĆane do pozostaÅĆych uczestnikÃşw. Host powinien umoÅijliwiaÄĞ tworzenie raportu ze spotkania, jako listy uczestnikÃşw, ich czasu na spotkaniu i listy przekazanych plikÃşw. Proponowany dalszy rozwÃşj: host na komputerze PC, przekazywanie obrazu wyÅŻwietlanego na smartphonie do innych urzÄĚdzeÅĎ. |
| **Requirements** | Windows Phone/Android |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-4 |

| Nr 7 | Meetings Helper Device |
|---|---|
| **Project goals** | Design and create prototype of device to simplify sending recorded materials (a/v, photos) to meeting attendees. |
| **Scope definition** | Meetings Helper should be a standalone device that would allow you to record audio / video and to take photos (with integrated camera or using a phone). At the beginning of the meeting attendees use their ID Cards (with RFID?) to register themselves at the meeting. During the meeting they take some photos / record videos and then using one button the device distributes recorded materials to everyone that has been attending (via e-mail). |
| **Requirements** | - |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1-2 semester |
| **Team size** | 2-4 |

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| Nr 8 | Knowledge-based Expert System simulation environment |
|---|---|
| **Project goals** | Ready to use simulation environment with CLIPS production system implemented. |
| **Scope definition** | Knowledge-Based Expert System (KBES) is an artificial intelligence branch used for defining human-like reasoning, i.e. decision-making. The goal of the project is to integrate CLIPS system with some simulation environment (e.g. MATLAB), propose the object to be controlled, and define some set of production rules to test, whether it works fine enough. |
| **Requirements** | C, C++, MATLAB, CMake, general AI knowledge |
| **Author** | Pawel Ptasznik |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

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| Nr 9 | Logs parser Eclipse plugin |
|---|---|
| **Project goals** | Implement Eclipse plugin that parses project source code for logs printings. After loading of log file plugin is capable to jump into source code to point the place where log was printed. There are many applications in the world that generate logs in text format. It is difficult to find quickly where given log message comes from. |
| **Scope definition** | - Plugin for Eclipse to index code and parse logs<br>- UI Eclipse configuration front-end<br>- Jump into code after selecting particular log line<br>- Ability to filter the log file after applying set of filters |
| **Requirements** | - Configurable log format<br>- Configurable log print functions in code (allow support standard and custom print functions)<br>- Jump into code after selecting particular log line<br>- Support for C/C++ or other languages |
| **Author** | Grzegorz Kokot |
| **Planned duration** | 2 semesters |
| **Team size** | 2-6 |

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| Nr 10 | Acceptance tests framework for JS-heavy web applications |
|---|---|
| **Project goals** | Web testing framework for acceptance tests in natural language (similar/based on Cucumber) for JS-heavy (AJAX) web applications. |
| **Scope definition** | Example:<br><br>`OPEN http://www.nsn.com`<br><br>`TYPE âĂŸhelloâĂŹ INTO .login-input`<br>`TYPE âĂŸpaswordâĂŹ INTO .pass-input`<br>`CLICK input[type=submit]`<br><br>`ASSERT SUCCESS`<br>`ASSERT .status CONTAINS âĂŸwelcomeâĂŹ`<br>`ASSERT .main-page IS VISIBLE` |
| **Requirements** | Java/C#/Python/JS |
| **Author** | Dominik Michalski |
| **Planned duration** | 1 semester |
| **Team size** | 1-3 |

| Nr 11 | Acceptance tests framework for REST APIs |
|---|---|
| **Project goals** | Web API testing/documenting framework in natural language (similar/based on Cucumber or Concordion). |
| **Scope definition** | Example:<br><br>`OPEN http://www.nsn.com/api/data?id=123`<br><br>`ASSERT SUCCESS`<br>`ASSERT RESPONSE IS JSON`<br>`ASSERT RESPONSE CONTAINS âĂŸ{`<br>`name: <string>,`<br>`pages: <array::int>,`<br>`data:  id: [1,2,3]`<br>`}âĂŹ` |
| **Requirements** | Java/C#/Python/JS |
| **Author** | Karol Andrusieczko |
| **Planned duration** | 1 semester |
| **Team size** | 1-3 |

| Nr 12 | RequireJS support in Eclipse |
|---|---|
| **Project goals** | Eclipse plugin that supports basic module operations like organize imports or âĂŸgo to definitionâĂŹ |
| **Scope definition** | - find usage of an object function<br>- jump to definition (file, function)<br>- organize imports<br>- moving renaming modules |
| **Requirements** | Java/JS |
| **Author** | Karol Andrusieczko |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

| Nr 13 | Smart, memory-saving collections in Java |
|---|---|
| **Project goals** | Java library to store large objects collections in memory. Research and comparison of different techniques. |
| **Scope definition** | Create library that transparently saves memory usage of large collections. For instance: serialize objects to disk when they are not accessed. |
| **Requirements** | Java |
| **Author** | Mateusz Jaworski |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

| Nr 14 | BootstrapTouch 3.0 |
|---|---|
| **Project goals** | Twitter Bootstrap theme with additional components |
| **Scope definition** | Port existing NSN internal web framework based on Twitter Bootstrap 2.3.2 to version 3.0. Write additional components in bootstrap conventions. |
| **Requirements** | HTML, CSS3, JS |
| **Author** | Karol Andrusieczko |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

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| Nr 15 | Jenkins Shepherd |
|---|---|
| **Project goals** | Single web application for multiple Jenkins servers managing |
| **Scope definition** | Functionalities: mass update, copying single job, copying whole configuration, defining workflows, aggregated statistics, visualisation of jobs relations |
| **Requirements** | NodeJS/Python/Java |
| **Author** | Mateusz Jaworski, Dominik Michalski |
| **Planned duration** | 1-2 semester |
| **Team size** | 1-4 |

| Nr 16 | PostgreSQL Shepherd |
|---|---|
| **Project goals** | Single application for multiple PostgreSQL instances managing |
| **Scope definition** | Functionalities: copying database or schema between instances, copying roles, executing queries in parallel |
| **Requirements** | NodeJS/Python/Java |
| **Author** | Wojciech Stachowski |
| **Planned duration** | 1-2 semester |
| **Team size** | 1-4 |

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| Nr 17 | Jenkins: deployment plugin |
|---|---|
| **Project goals** | Plugin for web applications deployment |
| **Scope definition** | After build:<br>- connect via ssh with remote server<br>- copy and unzip selected artefacts<br>- run script externally |
| **Requirements** | NodeJS/Python/Java |
| **Author** | Wojciech Stachowski |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

| Nr 18 | Automated PowerPoint generator |
|---|---|
| **Project goals** | Automated ppt presentation generator based on document templates with metatags |
| **Scope definition** | Library scans through ppt document, finds metatags i.e. {{document.title}}, {{picture}} and provides an interface for replacing them with text or images. |
| **Requirements** | Preferred language: C# |
| **Author** | Mateusz Jaworski, Karol Andrusieczko |
| **Planned duration** | 1-2 semester |
| **Team size** | 1-4 |

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| Nr 19 | Jenkins build trigger |
|---|---|
| **Project goals** | Jenkins plugin for builds triggering based on result of database query |
| **Scope definition** | Jenkins periodically queries the database, builds are triggered when query result matches given condition |
| **Requirements** | Support for PostgreSQL, MongoDb |
| **Author** | Jacek Tomasiak |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

| Nr 20 | Lightweight & energy saving continuous integration |
|---|---|
| **Project goals** | Lightweight server for running build scripts with command line interface for configuration and simple web page for results presentation. |
| **Scope definition** | Checkout SVN & Git repositories periodically Run build scripts Parse and visualise result files (Common formats). Notify and display build status (Web page, Emails |
| **Requirements** | Preferred technology: NodeJS |
| **Author** | Dominik Michalski |
| **Planned duration** | 1 semester |
| **Team size** | 1-4 |

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| Nr 21 | Performance tests plugin for Jenkins |
|---|---|
| **Project goals** | Jenkins plugin for execution and visualisation of performance testsâĂŹ results |
| **Scope definition** | - runs JUnit tests marked with @Performance annotation<br>- generates report in xml format<br>- presents results on CI server |
| **Requirements** | Preferred language: Java (JUnit) |
| **Author** | Dominik Michalski |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

| Nr 22 | Website branding validator |
|---|---|
| **Project goals** | Sometimes the branding (i.ex. name of company/product, logo or logotype) is changing. It would be useful to have a website crawler to walk the website and validate that all proper changes has been introduced. |
| **Scope definition** | A program in any form that will accept inputs as i. ex. renames, brand colors etc and will crawl given website looking for errors in logotype or branding. |
| **Requirements** | Continuous integration system |
| **Author** | Mateusz WroÅĎski |
| **Planned duration** | 1 semester |
| **Team size** | 1-2 |

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| Nr 23 | LTE System Verification news & team widget |
|---|---|
| **Project goals** | Goals of the project comprise design and implementation of system that contains:<br>- News & Team Server<br>- Windows Phone 8 widget<br>- Windows 7, Android, iOS widget<br>System should allow the end user to create any message (text, picture, video) on the server. End-widget (on mobile/PC platform) should allow to read published message (typed on the server) through RSS feed and also to open full HTML article in the browser. |
| **Scope definition** | System (i.e. web-based application) should allow creating any message that should be shared to all end-widgets on mobile/PC platform. It should give flexibility to the end-user when creating new message either by:<br>- Providing WYSIWYG editor<br>- HTML panel with standard text format options<br>- Upload panel that allows adding pictures/videos to page content<br>Also adding category to the article would be beneficial. End-user should be able to read only messages from favorite (subscribed) category. End-widgets should allow to read all published messages, refresh the messages, mark them as read, define view (only headers, headers+summary, headers+full article) etc. |
| **Requirements** | - Creative design of News & Team Server and end-widgets on different OS platforms.<br>- Programming language or development environment is free to choose âĂŞ open source-based libraries will be preferable<br>- Possibility of applying database systems<br>- Knowledge of Linux-based operating system<br>- Knowledge of networking protocols<br>- Knowledge of OOP including basics of network programming |
| **Author** | Radoslaw Idasiak |
| **Planned duration** | 1-2 semesters |
| **Team size** | 3-6 |

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| Nr 24 | BTS Test Line Monitor |
|---|---|
| **Project goals** | Goals of the project comprise design and implementation of remote monitoring tool providing online preview of test lines status and statistics with options for remote blocking and unblocking cells. |
| **Scope definition** | Application or web-based application should monitor and display statuses of test lines taken from specific .xml files defined in BTSs. Moreover it should provide a remote possibility of running predefined scripts in BTSs in order to block or unblock selected cells. Providing statistics of test line statuses with diagrams and charts would be also beneficial. |
| **Requirements** | - Creative design of News & Team Server and end-widgets on different OS platforms.<br>- Creative design of monitoring tool<br>- Programming language or development environment is free to choose (e.g., .NET, Java, Phyton, C++âĂę) âĂŞ open source-based libraries will be preferable<br>- Possibility of applying database systems<br>- Knowledge of Linux-based operating system<br>- Knowledge of networking issues (ssh, telnet, TCP/IP)<br>- Knowledge of OOP including basics of network programming |
| **Author** | Radoslaw Idasiak |
| **Planned duration** | 1-2 semesters |
| **Team size** | 1-2 |

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| Nr 25 | Wireless WCDMA Base Station Monitor |
|---|---|
| **Project goals** | NodeB wireless access module with data analysis application for Android (graphs, statistics etc.) |
| **Scope definition** | Main purpose for this project is to create wireless base station monitoring HW+SW solution for Field Verification and Technical Support technicians. The user will get the overview of basic NodeB parameters in live mode without the need of connecting wires to the site hardware. The main purpose of this project is to speed up on-field network maintenance and diagnosis. |
| **Requirements** | - To be familiar with microcontrollers e.g. ARM cortex-3/cortex-4 platforms.<br>- Knowledge about MAC layer, UDP, WiFi, Android OS<br>- Programming skills: C/C++, Java<br>- HW prototype for 10BaseT/Wireless converter<br>- Embedded application written in C/C++ for driving microcontroller<br>- Data acquisition and presentation application written in Java for Android OS |
| **Author** | Lukasz Sobczuk, Marcin Dudek |
| **Planned duration** | 1-2 semesters |
| **Team size** | 1-2 |

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| Nr 26 | Voice Quality tester for WCDMA AMR connections |
|---|---|
| **Project goals** | Standalone device designed to test quality of voice connections in WCDMA networks |
| **Scope definition** | Main purpose for this project is to create voice quality testing system which is capable to establish AMR connection to itself, generate defined acoustic signal and display Fourier analysis of the same signal at the other side of connection. System can be based on commercial phones. |
| **Requirements** | - To be familiar with microcontrollers and DSP<br>- Basic knowledge about WCDMA networks and AMR voice codec<br>- Programming skills<br>- HW prototype<br>- Embedded application for driving microcontroller and signal processing |
| **Author** | Marcin Dudek |
| **Planned duration** | 1-2 semesters |
| **Team size** | 1-2 |